

## Interpreting Microbiological Sampling Results

Sending samples of food for analysis allows us to identify the presence of harmful bacteria in food and what action is required to ensure consumer safety. It helps us to assess if the food was handled and stored hygienically.

We take food samples as part of local or national surveys, as part of an inspection or to monitor high risk food premises. From time to time we may also take environmental samples such as swabs of work surfaces, touch points and equipment, and even cleaning cloths. These allow us to assess the effectiveness of cleaning and give an indication of how cross contamination is being controlled.

Samples are tested for the presence of some or all the following bacteria:

Aerobic Colony Count (ACC)	Bacillus cereus and Bacillus species
Eschericia coli	Listeria species
Enterobacteriaceae	Salmonella species
Staphylococcus aureus	Campylobacter species
Clostridium perfringens	

### **Aerobic Colony Count (ACC)**

This is the total bacteria found in food. This examination is carried out on most foods, the exception being those foods that would naturally contain high levels of harmless bacteria e.g., salamis and milk products. A high ACC may indicate poor practice in processing, preparation, storage, or stock control. For example, that the food has been kept too long or that it has been left unrefrigerated. Refrigeration of food slows down growth of most bacteria.

## **Hygiene indicator organisms**

### **Enterobacteriaceae**

This family of bacteria includes some found in the human and animal gut, but some are widespread in the environment. This means they are often found in salad and other vegetables. When sampling, Enterobacteriaceae are useful indicators of hygiene and of post processing contamination of ready to eat food. For example, cooked meat being prepared on a dirty slicer. It is vital that raw vegetables, including salad vegetables, are thoroughly washed before serving. Unwashed raw vegetables should be kept separate from ready to eat foods. Equipment must be thoroughly cleaned and disinfected at regular intervals.

### **Eschericia coli (E coli)**

A bacterium which is found in the human and animal gut. It may be transmitted through faecal contamination at slaughter and/or poor personal hygiene of food handlers.

The presence of indicator organisms in a food or environmental sample does not necessarily mean that harmful bacteria are present. However, their presence may be associated with an increased likelihood of the presence of harmful bacteria and may indicate one of more of the following:

- Faecal contamination
- Poor food handler hygiene

- Poor quality of raw materials or food components
- Cross-contamination
- Poor cleaning
- Poor time/temperature control during processing

## **Pathogens (Dangerous / Harmful food poisoning bacteria)**

### **Escherichia coli O157 (E coli)**

This strain of E.coli and other VTEC\* producing strains of this bacteria can cause serious illness. This bacteria is associated with raw meat which is likely to be contaminated at slaughter and raw vegetables.

The centre temperature of processed meats e.g. burgers and sausages should reach core temperatures of at least 75°C for 30 seconds, or equivalent temperature/time combination, or until the juices run clear. Raw meat and unwashed vegetables must be prepared away from ready to eat food. Best practice would be to prepare in a separate area. Always ensure fruit and vegetables are washed prior to preparation. Never wash raw meat.

*\*Vero cytotoxin E.coli (VTEC) are a group of bacteria able to produce a toxin that is able to rupture and destroy red blood cells. This can lead to a condition called haemolytic-uremic syndrome (HUS) and kidney failure.*

More information is available here [E. coli cross-contamination guidance | Food Standards Agency](#)

### **Salmonella species**

Food poisoning bacteria which can be found in the intestines of animals, humans and in polluted waters. Salmonella may be present in food due to insufficient cooking of contaminated foods, or due to cross contamination or poor personal hygiene. Although it is now safe for most people to eat uncooked UK hen eggs there continue to be outbreaks of food poisoning involving non-UK eggs. Care should always be taken when handling shell eggs. Non-UK eggs should not be used in dishes that are uncooked or partially cooked. Always wash hands after handling shell eggs

### **Staphylococcus aureus**

A bacterium that can produce a toxin in food that can cause food poisoning once the food is consumed. It is found in the nose and mouth of humans and in uncovered wounds, cuts, spots, boils etc. The presence of these bacteria in food is usually due to poor personal hygiene. It is essential that hands are washed before handling food and that wounds, spots, etc. are covered.

### **Clostridium perfringens**

A bacterium found in the gut of animals and humans and can survive in spore form in the environment. Some strains can cause food poisoning. Cooking at high temperature for sufficient time will reduce its presence. It is also essential to ensure that where necessary foods are cooled rapidly and kept cold. As with all bacteria it is vital to prevent cross contamination from raw to cooked foods, especially uncooked meats.

### **Bacillus species and specifically Bacillus cereus**

Food poisoning bacteria that are widely distributed in the environment, and therefore found on grains, beans, pulses etc. It is essential that foods are cooked thoroughly, and if not being served immediately they must be cooled as quickly as possible (below 8°C within 90 minutes). These bacteria can produce spores and are usually associated with rice dishes where large volumes of food are produced in advance and may be cooled slowly over several hours. Refrigeration slows down the growth of the bacteria.

### **Campylobacter**

Some species are known to cause food poisoning even when very low numbers are consumed. These bacteria can be found in the gut of some animals. If found in food it could be due to insufficient processing such as pink burgers or not cooking the centre of a rolled joint of meat. It could also be from contamination after processing such as contamination by pets or other domestic animals. Foods must be cooked thoroughly and once cooked must be kept away from any sources of contamination.

### **Listeria species especially Listeria monocytogenes**

Found in the environment and are usually associated with salads, patés and soft cheese. Its presence in cooked foods can be an indication of insufficient cooking or contact with raw foods. This bacterium can even grow at refrigeration temperatures (as low as -1°C) and it is therefore essential that foods are cooked thoroughly and covered, and that all equipment and surfaces are cleaned thoroughly. Make sure food is used within its use by date.

## **Reporting results to you**

Once we have received the results from the laboratory, we will notify you. Results are compared with current guidelines and graded in the following way:

- **Satisfactory:** Means that the bacteria found were at acceptable levels.
- **Borderline of acceptability:** There were higher than expected levels of bacteria. Proprietor must review systems of work to ensure that safe food is produced
- **Unsatisfactory:** This indicates problems with food handling. An urgent review of food handling procedures is required to ensure that food does not cause food poisoning.
- **Unacceptable / Potentially Hazardous:** Consumption of this food may cause illness. Immediate action is required.

Where we receive notification of an unsatisfactory or unacceptable result, we will generally re-visit the premises to offer advice. Re-sampling may happen at a later date to ensure that practices have been improved. In some cases enforcement action may be required.

**Follow these simple rules to help you to control the quality and safety of your food:**

- Identify all steps in your activities which are critical to food safety. You could use Safer Food Better Business or a similar food safety management system.
- Put adequate safety controls in place.
- Only purchase from reputable suppliers
- Adequately train all staff in food hygiene and monitor their handling practices.
- Wash hands thoroughly before handling food, and again between handling raw and cooked foods, after visiting the toilet or removing the rubbish.
- Clean all equipment, utensils and preparation surfaces thoroughly.
- Prepare raw and ready to eat food in a separate area using separate equipment. This includes raw vegetables.
- Keep cooked and raw foods separate during storage.
- Wash salads and fruit thoroughly; Fruit should be washed before preparation
- Use food within its use-by-date and promptly use foods you have prepared yourself. Labelling them will help with this
- Keep food covered.
- Use a thermometer to monitor temperatures of cooked food and fridges and disinfect the temperature probe each time that it is used.
- Cook food thoroughly (centre temperature more than 70°C for 2 minutes or 75°C for 30 seconds) and serve.
- If hot holding keep above 63°C;
- Re-heat food to at least 75°C; only reheat food once.
- Ensure any food requiring refrigeration is kept below 8°C and not left out for long periods.
- Where food is left out for a period of time for service or on display (up to 4 hours) do not repeat this for a second time. This food should be used or discarded.
- When preparing food in advance, ensure food is cooked thoroughly, cooled rapidly (within 90 mins) and stored in the fridge.
- If using shell egg in a dish that will not be cooked, ensure they are UK hen eggs. For vulnerable groups use only eggs produced under the Lion code or Laid in Britain egg assurance scheme.
- Non-UK eggs and eggs from species other than chickens, for example, duck or quail, should always be thoroughly cooked
- Cleaning chemicals used should conform to British Standard BS EN 1276:2009 or BS EN 13697:2001. They should be used as part of a two stage clean and the disinfectant must be left on the surface for the current contact time.

More information is available on this fact sheet [E. coli O157 Cross-contamination Caterers Factsheet \(food.gov.uk\)](#)